DOCUMENT RESUME

ED 223 988 CS 006 913

AUTHOR Coots, James H.; Snow, David P.
TITLE Understanding Poor Reading Comprehension: Current Approaches in Theory and Research.
INSTITUTION Southwest Regional Laboratory for Educational Research and Development, Los Alamitos, Calif.
SPONS AGENCY National Inst. of Education (ED), Washington, DC.
REPORT NO SWRL-TN-2-80/26
PUB DATE 30 Nov 80
CONTRACT 400-80-0108
NOTE 28p.
PUB TYPE Information Analyses (070)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Academic Aptitude; *Decoding (Reading); Learning Theories; *Reading Ability; *Reading Comprehension; *Reading Difficulties; *Reading Processes; Reading Rate; *Reading Research; Reading Skills

ABSTRACT

Two views of the sources of poor reading comprehension are currently distinguishable in the research literature: a decoding sufficiency view and a comprehension skills view. The decoding sufficiency view argues that decoding is the only skill that must be acquired for general language comprehension. The broader, comprehension skills hypothesis argues that a deficiency in any of several basic component skills could thwart reading comprehension mastery. R. M. Golinkoff's major review of studies comparing good and poor comprehenders posited three components of comprehension: decoding, lexical access, and text organization. Research on decoding has yielded some hypotheses relating decoding speed to comprehension, but problems of study design cast some doubt on these conclusions. Research on lexical access ability indicates that poor comprehenders do not typically lack this ability; however, if cognitive overload during reading is more frequent among poor comprehenders, it is likely that lexical access functioning will deteriorate. Most clearly, text organization research has consistently shown that poor comprehenders are word-by-word readers while good comprehenders employ higher level strategies. (JL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED223988

SOUTHWEST REGIONAL LABORATORY
TECHNICAL NOTE

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

SWRL

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

DATE: November 30, 1980

NO: TN 2-80/26

UNDERSTANDING POOR READING COMPREHENSION: CURRENT APPROACHES IN THEORY AND RESEARCH

James H. Coots and David P. Snow

ABSTRACT

Two theoretical views of the development of reading comprehension ability are presented. Within each view, reading comprehension is related to other skills and knowledge which are essential in mature reading. Basic research studies that bear upon issues engendered by the two theories are then reviewed, with special emphasis on differences between good and poor comprehenders.

This report was prepared under Contract No. 400-80-0108 with the National Institute of Education, Department of Education. Its contents do not necessarily reflect the views of the National Institute of Education or of any other agency of the United States Government.

CS206923

This document is intended for internal staff distribution and use. Permission to reprint or quote from this working document, wholly or in part, should be obtained from SWRL, 4665 Lampson Avenue, Los Alamitos, California 90720

UNDERSTANDING POOR READING COMPREHENSION: CURRENT APPROACHES IN THEORY AND RESEARCH

James H. Coots and David P. Snow

Students who comprehend what they read only poorly, or in some cases not at all, present a significant, serious problem to educators. Design of instructional interventions to either prevent or remediate the development of poor reading comprehension skills requires an understanding of the nature of the reading comprehension problem.

Although reading comprehension activities are often found in the primary grades curriculum (Snow, 1980), it is not until the upper elementary years that failure to comprehend what is read becomes a serious impediment to classroom learning. By this point in the child's schooling, however, most of the direct instruction that he or she will receive in reading--that is, in decoding--has been completed, and little or no direct instruction in comprehension itself can be expected (Durkin, 1978). If the child has failed to become a good comprehender by this time, the typical remediation strategy is to recycle back through significant portions of decoding instruction. But if this recycling strategy is not effective, the child may never become a good reader, for the teacher has no alternatives in remediating poor comprehension ability. For this reason, we are attempting to understand the reading comprehension problem as it exists among children in grades 4-6 with the hope that alternatives to remediation can be formulated and tested in future inquiry. Our review of relevant findings will extend to research on readers at other grade levels, however, when it contributes to clarification of issues relevant to the target population.

In this paper we examine two theoretical views of the sources of reading comprehension ability. Both views relate ability in reading comprehension to ability in other aspects of reading, such as decoding skills and vocabulary knowledge. Therefore, they are helpful in guiding the formation of hypotheses about causes of poor reading comprehension and about possible approaches to prevention and remediation.

In the second part of the paper we review research findings that bear upon critical issues in understanding poor reading comprehension. In exploring such issues, researchers typically compare the performance of good and poor comprehenders on tasks presumably related to ability in reading comprehension. Thus, our review is almost exclusively a comparison of good and poor comprehenders.

SOURCES OF POOR READING COMPREHENSION

Two views of the sources of poor ability in reading comprehension are currently distinguishable in the research literature: a decoding sufficiency view and a comprehension skills view.

Many researchers working toward remediation of failure to acquire adequate reading comprehension skills assume that such failure arises from deficiencies in development of decoding skills. In this view, decoding ability is considered necessary, even sufficient, for development of comprehension skills. This position is referred to as the <u>decoding sufficiency hypothesis</u> (Fleisher, Jenkins, and Pany, 1979).

Proponents of the decoding sufficiency hypothesis do not argue that reading is just decoding; rather, that decoding is the only skill that must be acquired in order for general language comprehension

skills to become functional in reading. It is assumed that once the written code is learned, text comprehension will be equivalent to comprehension of oral language, which is assumed to be good to adequate in most children.

The reasonableness of the decoding sufficiency position is supported by observation of oral reading behavior. Most poor comprehenders are poor oral readers as well. They read slowly, word by word. They have considerable difficulty decoding unfamiliar words, and they make numerous decoding errors (Golinkoff, 1975-76).

Additional support for the decoding sufficiency hypothesis comes from developments in theoretical models of human information processing. Both LaBerge and Samuels (1974) and, more recently, Perfetti and Lesgold (1979) have related the processing requirements of decoding and comprehending to well documented limitations in human information processing capacity. According to these theorists, the remedy for poor comprehension ability is development of decoding skills to the point where they operate "automatically." Once decoding skills function automatically, it is argued, processing capacity will be freed so that the reader can begin to focus attention on the task of comprehending the text. With the requisite processing capacity available, the development of reading comprehension ability should proceed smoothly.

The decoding sufficiency hypothesis is quite reasonable so long as the picture of poor comprehenders sketched above is valid. That is, readers who are poor comprehenders are invariably poor decoders as well. But two categories of observation disconfirm the universality of this relationship. First, some researchers have reported finding

poor comprehenders who are alleged to have adequate decoding skills (e.g., Cromer, 1970). Second, other readers have been found to display good comprehension of passages in which their decoding ability was judged to be poor (Calfee, Note 1). Both observations refute the presumption of an invariant relationship between decoding and comprehension skills development that is central to the decoding sufficiency hypothesis.

Wiener and Cromer (1967) argued that there exist several possible relationships between decoding ("identification") and reading comprehension, rather than the single relationship wherein decoding skill is viewed as a sufficient antecedent to comprehension ("the single process view"). Within the single process view, decoding and comprehension represent little more than separate emphases upon a single behavior--reading. In contrast, the Wiener and Cromer position is that different activities are implied within each component, but that the components do not imply one another.

From this position Wiener and Cromer (1967) identified four categories of poor readers, each referenced by some functional relationship between decoding skills, comprehension skills, and the learning ability of the reader. Poor readers who exemplify a <u>defect</u> model are those who are unable to benefit from instructional experiences because of some relatively permanent physical impairment. For example, a child who suffers from a physical injury to the brain may be a defect poor reader.

The <u>deficiency</u> model covers all cases in which the reader lacks mastery of some basic component of reading such as decoding skill, vocabulary knowledge, or oral language proficiency. The decoding

sufficiency hypothesis is a restricted deficiency model. It recognizes a deficiency in decoding skills as the sole impediment to reading proficiency. In Wiener and Cromer's deficiency model, however, any component, basic skill could thwart reading comprehension mastery. A deficit poor reader could have adequate decoding skills and poor vocabulary development or the reverse, or deficits in both skills, any of which conditions would preclude good comprehension. This is a much broader view of the relationship between basic skills and reading comprehension ability than the single process view.

Poor readers who fall within the disruption model exhibit some interfering behavior or attitude which must be removed or circumvented before high level reading can occur. For instance, children who are anxious or compulsive fit the disruption model when their anxiety or compulsivity is uncontrolled. The disruption can be either temporary or nearly so permanent as to constitute a defect (above). It may affect the functioning of specific reading processes, or result in a general depression of reading effectiveness.

Finally, some poor readers seem to have all the prerequisite skills and they exhibit no identifiable defects or disruptive behaviors, yet they still do not read well. Wiener and Cromer (1967) suggested that a difference model is appropriate to account for the difficulties of such readers: they differ from good readers merely in the strategies they employ in the act of reading.

In the case of both disruption and difference poor readers, the Wiener and Cromer (1967) analysis implies that lack of comprehension ability is not attributable to poorly developed decoding skills. This

analysis predicts the existence of poor comprehenders who exhibit decoding skills comparable to those displayed by good comprehenders of roughly the same age and general academic ability, just as found by Cromer (1970). Other poor comprehenders, in contrast, should exhibit poor skills in decoding or vocabulary, as predicted by the deficit model of reading failure. While no one disputes the existence of poor comprehenders who show significant deficits in decoding skills, the reality of poor comprehenders with adequate decoding skills is controversial (e.g., Calfee and Drum, 1978; Gough and Hillinger, 1980). However, reports from several sources (e.g., Cromer, 1970; Cunningham, 1979; Levin, 1973) suggest their existence.

In sum, two clear theoretical positions have emerged with regard to early difficulty in acquisition of comprehension skills. First, the entire problem is seen to be caused by inadequate development in decoding skills. Researchers who favor this decoding sufficiency explanation argue that poor comprehenders need additional instruction on decoding. Instruction should emphasize drill so that poorly developed decoding skills might be executed more and more automatically (Perfetti and Lesgold, 1979).

The second position is that poor comprehension ability may be caused by any of several factors, including poor decoding skills development. This view considers as untenable any position in which poor comprehension ability is universally attributed to the effect of a single factor, such as decoding. Because of the growing research activity generated by avid proponents of the decoding sufficiency view, this alternative position has become known more for its opposition

to decoding sufficiency than for its advocacy of multiple causes of poor comprehension. In practice, it is often a decoding insufficiency position. To emphasize the multi-causal orientation of this position, however, we refer to it as the comprehension skills view.

If decoding is seen as insufficient to support full development of reading comprehension ability, what skills must be mastered in addition to decoding? No one seems to be able to answer this question definitively at this time. But we can begin to explore areas where the answer might lie. A useful approach is to imagine a reader who exemplifies Wiener and Cromer's (1967) difference model. This reader is a poor comprehender with no identifiable deficits in basic reading skills, and with no known defects or disrupting behaviors. In the Wiener and Cromer analysis the difference poor reader is viewed as possessing "response patterns" inappropriate to comprehension of the material being read. To quote the authors, "This model assumes that the individual would read adequately if the material were consistent with his behavior patterns; thus, a change in either the material or in his patterns of verbalization is a prerequisite for better reading" (1967, p. 629).

In the somewhat different cognitive-behavioral orientation of the 1980s, we translate Wiener and Cromer's (1967) "response patterns" to "processing strategies." The translation implies a concern for the appropriateness of the difference poor reader's interpretation of reading and moment-by-moment interaction with elements of the text. It implies a discourse-level view of text processing in which the reader must continuously strive to integrate new semantic elements with the existing representation of the text's meaning. As we shall see below, these text processing behaviors

do not appear to characterize the reading activities of poor comprehenders. Regardless of their skills level in decoding, poor comprehenders appear to lack the processing strategies necessary for appreciation of the semantic aspects of texts.

GOOD AND POOR COMPREHENDERS

A major review of studies comparing good and poor comprehenders was conducted by Golinkoff (1975-76). Her focus was a comparison of comprehension processes across the two reading groups as generally differentiated by overall scores on standard reading tests.

Based on Golinkoff's review of more than 70 relevant studies, the following conclusions are suggested: First, good and poor comprehenders can often be differentiated by decoding ability, but not always. Second, poor comprehenders do not possess well developed text organization skills. That is, in contrast to good comprehenders, poor comprehenders do not typically exercise the skills necessary for extracting meaning from units larger than single words--phrases, sentences, and paragraphs. Third, poor comprehenders do not exhibit difficulty in accessing the meanings of individual text words from memory so long as those words are short and familiar.

These three conclusions reflect components of the analytical model used by Golinkoff in conducting her comparison of good and poor comprehenders. Comprehension, she reasoned, requires of the reader the decoding (pronunciation) of words, the access of their individual meanings in memory (lexical access), and knowledge about how they combine (syntax) to create larger units of meaning. We shall examine the research findings within each processing area.

Decoding

As early as the middle of the last century, educators were clearly concerned with understanding the relationship between decoding skill and reading comprehension (Gough and Hillinger, 1980). The usual paradigm for exploring this relationship involves classifying readers into two or more groups on the basis of either comprehension or decoding performance, then observing behavior on a task from which inferences about ability on the nonclassification variable can be drawn. For example, Clay and Imlach (1971) divided children into groups based upon decoding speed and accuracy in an oral reading task. They observed that the best decoders read in a pattern of stresses occurring about every 4.7 words, which corresponded to typical length of phrases. Poor decoders, in contrast, stressed each word as it was read. This suggests that good decoders are able to organize the text more effectively than poor decoders in the quest for comprehension during reading.

A more common classification is on the basis of reading comprehension performance. For example, Weber (1970) observed the oral reading behavior of first grade good and poor comprehenders. Good comprehenders tended to make errors that did not distort the meaning of the text, but when meaning was distorted, good comprehenders self-corrected such errors 85% of the time. Poor comprehenders, on the other hand, made more frequent meaning distortion errors and self-corrected only half as often (42%) as good comprehenders. Weber concluded that poor comprehenders failed to use syntactic-semantic cues as aids to decoding.

Calfee and Drum (1978) have pointed out that while some poor comprehenders seem to decode as accurately as their good comprehender

peers (e.g., Levin, 1973), the equivalence in decoding ability disappears when speed is introduced as a dependent measure. Golinkoff and Rosinski (1976) tested this point in a general way by timing third and fifth graders on a decoding task using words commonly found in first grade readers. The familiarity of the words ensured decoding accuracy. Good comprehenders decoded slightly faster than poor, but not significantly so. When the two groups decoded a list of CVC nonsense syllables, however, good comprehenders were more than twice as fast as poor comprehenders.

Similar results were obtained by Perfetti and Hogaboam (1975) using real words. In a timed pronunciation task in which single words were presented tachistoscopically, only a slight difference was found in the pronunciation latencies of good and poor comprehenders when the words were of high frequency (i.e., familiar). But when low frequency words were used, the good comprehenders were much faster than the poor comprehenders. Interestingly, the good comprehenders were equally fast with high and low frequency words. The difference between groups was caused by the slowing down of the poor comprehenders when low frequency words were presented.

Perfetti (1977) has asserted that the speed of decoding is a measure of the automaticity of this processing step. In a series of well designed studies, Perfetti and his colleagues have used the latency measure to show how good and poor comprehenders differ on a variety of pronunciation, matching, and categorization tasks (Perfetti, Goldman, and Hogaboam, 1979; Perfetti and Lesgold, 1977, 1979). The general picture is that as words become less familiar, requiring the execution of word attack skills as opposed to recognition (i.e., "sight word") processes, skilled readers perform increasingly faster than poor readers.

Two general problems pervade the Perfetti studies, however. The first is control of "familiarity" of words across groups of readers. Because good comprehenders probably read a lot more than poor comprehenders, they are likely to have a larger repertory of familiar words. So as words decrease in frequency of usage, the poor comprehender encounters the unfamiliar much sooner than the good comprehender. What would happen to the decoding latencies of good comprehenders at equally difficult levels of word familiarity? A study reported in Perfetti (1977) obliquely addressed this issue by controlling exposure of good and poor readers to the oral and written forms of novel words, and to their meanings. Subsequent decoding latencies showed the usual differences across groups, but the differences were greatest with completely novel (unseen and unheard) words and decreased considerably with amount of previous exposure. This finding suggests that good comprehenders do decode more rapidly than poor, but that their advantage is reduced when prior exposure to words is controlled. Given that prior exposure is not controlled in the natural setting, differences in decoding ability may reflect little more than amount of reading experience. Further evidence supporting this conclusion comes from studies in which attempts were made to minimize vocabulary differences as a source of variation between good and poor readers. Using groups matched on vocabulary skills, Guthrie (1973), for example, found that poor readers performed lower than good readers on two comprehension tasks but were equal on decoding speed.

The second difficulty with the Perfetti studies, and with all others in this area, is that the conclusions are based solely on grouped, cross-sectional data. Because skilled reading includes such a complex interplay

of component processes, it is unreasonable to expect that good comprehenders and poor comprehenders represent internally homogeneous groups with regard to reading skills and strategies. It is unlikely that poor comprehenders are all alike in vocabulary knowledge, word attack skills, and reading experience, for example. Research must take such differences into account. Because observations that bear upon the relationship between decoding and comprehension are not grounded in analyses of individual subject data, we concur with Golinkoff (1975-76) that "the way in which decoding skills affect text comprehension is still unclear."

Lexical access

Between the act of attending to words in print and that of creating propositional structures that represent perceived semantic relationships among words, the reader must access the meanings of individual words or idiomatic expressions from memory. The beginning reader must also decode each printed word into its oral equivalent, presumably for the purpose of achieving access to semantic memory via the already well developed oral language channel. But the decoding of each word may not be required by an accomplished reader, for the print code itself may be sufficient to support the process of lexical access to memory (Oaken, Wiener, and Cromer, 1971).

Regardless of reading proficiency, however, the reader cannot avoid the process of lexical access in the quest for comprehension. Is this process a barrier to the development of comprehension ability? Do poor comprehenders have less efficient access to lexical memory than good comprehenders? Golinkoff's (1975-76) conclusion was that lexical access is not itself a problem to the poor comprehender so

long as the reader has a meaning for the word already stored in memory and the word's oral (or visual) representation is known to the reader.

The conclusion that poor comprehenders do not typically lack lexical access ability in reading has consequences for instruction. Lexical access ability is an important feature of general language functioning, not just reading. If by extension we can assume that poor readers do not typically suffer a general language deficit, the implication is that their comprehension problems are peculiar to reading itself rather than to general language functioning. Thus, effective remediation of reading problems ought to focus on the student's reading behavior. This orientation is supported by Golinkoff's (1975-76) conclusion that poor comprehenders are usually inferior to good comprehenders in decoding and text organization, both of which are critical to reading in ways not shared by other language operations.

Finally, Golinkoff cautioned that any reader's facility with lexical access may deteriorate when words become longer, less familiar, or in any way more difficult to decode. Her reasoning was based on a limited capacity model of cognitive functioning, as presented by Perfetti and Lesgold (1977), for example. Any change in the input conditions or output demands which serve to reappropriate cognitive processing resources to focus on one component of the system is viewed as having deleterious effects on other components. This analysis underscores the interdependence among system components, as expressed by Perfetti and Lesgold: "The component processes are isolable in principle although interrelated in practice" (1979, p. 58). Whether cognitive overload affects the process of lexical access any differently

among good than among poor comprehenders is not known. However, if it is assumed that the incidence of cognitive overload during reading is much more frequent among poor comprehenders, simply because their skills operate less efficiently, then they are more likely than good comprehenders to experience whatever deterioration of lexical access functioning Golinkoff had in mind.

Text organization

Golinkoff (1975-76) used the term text organization "to imply the extraction of meaning from units larger than the single word, such as phrases, sentences, and paragraphs" (p. 633). Her review of this area is very good, covering the relevant findings from Buswell's (1920) eye-voice span research through current investigations within the cognitive science metaphor (e.g., LaBerge and Samuels, 1974). Our review will begin with a summary of the Golinkoff analysis, to which we will add more recently discovered information.

The Buswell (1920) studies were designed to explore the hypothesis that poor oral readers fail to sample text information beyond the confines of the word currently being decoded. If they were capable of sampling syntactic and semantic information from surrounding text, they would not be expected to make the pronunciation errors that they do, especially with regard to ambiguous homographs. To investigate this hypothesis, Buswell employed a variety of experimental manipulations to determine the difference between momentary visual focus and simultaneous vocalization. This measure, known as eye-voice span, or EVS, was found to be highly correlated with oral reading ability and with reading comprehension. Good comprehenders were found to have an average

EVS of 13.8 letter spaces, while poor comprehenders had only 8.7 letter spaces. Thus, good readers, on the average, were sampling text visually about two words in advance of their oral pronunciation. On the other hand, poor readers kept only about one word ahead of their vocalizations. The wider the EVS, the greater the potential for organizing the text, and the greater the impact of syntactic and semantic features on current vocalization.

Buswell also noted that those with a wider EVS exhibited more expression in their vocalizations, which clearly implies greater text organization and understanding. Additionally, the EVS of good readers was much more flexible than that of poor readers, and their regressions occurred across phrases and sentences rather than within words, the latter being characteristic of poor readers. Altogether, the Buswell findings show a remarkable difference in the text sampling operations of good and poor readers. These data imply corresponding differences in informational organization skills.

Despite considerable changes in theory and methodology since the time of the Buswell (1920) studies, virtually no evidence has been put forth to challenge Buswell's conclusions (e.g., Lefton, Nagle, Johnson, and Fisher, 1979). Subsequent investigations have confirmed the characterization of the poor comprehender as a word-by-word reader (e.g., Clay and Imlach, 1971) who lacks processing flexibility (e.g., Smith, 1967) and samples information from a very restricted visual window (e.g., Willows, 1974).

Results of a study by Cromer (1970) suggest that word-by-word reading characterizes poor comprehenders even at the junior college

level. When poor comprehenders received texts in which the words were presented singly, they performed at least as well on subsequent comprehension items as when the text was presented in normal format, and some performed even better. The failure of isolated word presentations to cause degeneration in comprehension implies that during normal reading poor readers employ text processing strategies analogous to those required by the isolated word format. Good readers, on the other hand, suffered a decrease in comprehension scores following isolated word presentations, which implies that this presentation mode was not accommodated well by their normal processing strategies.

A controversial outcome of Cromer's (1970) study (see Calfee, Arnold, and Drum, 1976) is that some poor comprehenders evidenced improved comprehension scores when the texts were presented in phrasal segments. The same students showed poor comprehension of texts presented either normally or one word at a time. The facilitating effect of phrasally segmented text, then, implies that such poor comprehenders lacked text organization skills, for when organization was supplied by features of the presentation format, their strategy deficiencies were overcome and they processed text in a manner conducive to good comprehension. Cromer claimed that these poor comprehenders exemplified the difference readers of the Wiener and Cromer (1967) classification.

Another way to characterize poor comprehenders is that they are "bottom-up" rather than "top-down" processors of text (see Frederiksen, 1979). The problem is, however, that they do not process very far "up" into the semantic superstructure. An interesting question is whether or not they could be induced to engage in higher-level processing if a

semantic overview of text organization were provided prior to reading. The result might be that they would make fewer decoding errors because of the semantic convergence now available to assist them in identifying words. Steiner, Wiener, and Cromer (1971) tested this possibility by asking fifth grade good and poor comprehenders to read aloud a passage either preceded or not preceded by a summary of its semantic content. Contrary to the hypothesis above, poor comprehenders did not reduce their decoding errors, nor were they more likely to spontaneously correct their errors, when supplied with the summary. It does not seem that the presence of explicit contextual information deterred these poor comprehenders from apparently exclusive use of a bottom-up strategy during reading.

Bransford (Note 2) provided supporting evidence for this inability of poor readers to capitalize on higher-order information. In a lexical memory task in which fifth graders were allowed to elaborate the context to support recall of a target word, poor comprehenders tended to supply nonfunctional, and thus less useful, elaborations. For instance, in (1) the target word was strong. Good comprehenders filled the blank

(1) The strong man helped the boy _____.

with functional elaborations such as, "lift the heavy box." The elaborations of poor comprehenders were nonfunctional, such as, "cross the street." Not surprisingly, when elaborations later served as cues on a recall task, good comprehenders performed significantly better than poor. But even when poor comprehenders were supplied with functional elaborations, they failed to improve their recall of the target items.

In other words, they were unable to use high-level semantic information to facilitate performance on a low-level task.

A number of studies have shown also that poor readers do not attend to features of text organization at the syntactic level. Weinstein and Rabinovitch (1971) tested the recall of good and poor fourth grade readers for lists of nonsense items and grammatical markers. In half of the presentations, the nonsense items were embedded within a grammatical frame. In the other half, the grammatical markers and nonsense items were ordered randomly. Good readers learned to recall the grammatical lists to criterion much quicker than the ungrammatical lists, but for the poor readers there was no difference across list structures. Since the two groups were equivalent in recall of the ungrammatical lists, the improvement of good readers on the grammatical lists must be attributed to their ability to use the grammatical structure. Poor readers, in contrast, were unable to benefit from syntactic structure, which implies that they read both lists word by word, insensitive to syntactic aids. Isakson and Miller (1976) reported a similar differential effect of syntactic structure on decoding errors of good and poor comprehenders.

Not only are good readers able to use syntactic structure when readily available, they apparently strive to impose it even under adverse conditions. For instance, fifth grade good readers in the Steiner et al. (1971) study read text in meaningful phases even when the input was presented one word at a time. This observation indicates that fundamental differences in processing strategies constitute much

of the distinction between good and poor readers, regardless of other differences that may coexist at the level of basic skills, such as decoding.

To illustrate the interdependence of the component processes of reading within skilled reading behavior, note the finding by Isakson and Miller (1978, cited by Ryan, in press). When good and poor comprehenders were equated for ability to recognize words in isolation, good comprehenders at each grade level from two through six made significantly fewer errors than poor comprehenders when reading words from sentences. Context, then, provided an organization that facilitated decoding and, we can assume, led to better comprehension too. Thus, the good comprehender, unlike the poor, engages in considerable top-down processing of text (Frederiksen, 1979).

SUMMARY

How is our understanding of poor reading comprehension enhanced by available theory and research?

Although the decoding sufficiency view and the comprehension skills view are clearly different in the prerequisites they recognize as critical for development of reading comprehension ability, both positions regard reading comprehension to be a high-level skill that cannot operate until more basic skills have been mastered. Thus, poor reading comprehension ability should not be considered in isolation from other component skills in reading. Also, the problem of preventing or remediating poor comprehension ability must be regarded as a complex task involving consideration

of the highest level of language and other cognitive functioning. Successful comprehension has no peer in a hierarchical analysis of reading skills.

Differences between the two major views of reading comprehension development have made one issue salient. This issue concerns the sufficiency of decoding skill in the development of comprehension ability, or more generally, the relationship between decoding and comprehension. If decoding skill is a sufficient condition for the achievement of reading comprehension, then all poor comprehenders ought to be poor decoders, and all good comprehenders, good decoders. If decoding skill is not sufficient, then some good decoders ought to be poor comprehenders. And finally, if skill in decoding is not necessary for comprehension of printed text, then some poor decoders ought to be good comprehenders.

The research literature is yet unclear about the relationship between decoding ability and reading comprehension. This uncertainty is due in part to a lack of agreement among researchers about the appropriate dependent measure for judgments of decoding skill. When accuracy alone is used, it seems that some poor comprehenders do possess "adequate" decoding skills. But when speed is added as a criterion measure, clear differences emerge between groups of good and poor comprehenders. Speed differences within component processes become important when a shared capacity model of reading behavior is employed in the analysis of reading comprehension ability (Perfetti, 1977). Whether there are certain types of poor comprehenders who have the skill to match good comprehenders on decoding speed is unknown, for

only grouped data have been reported in the literature. Considerable uncertainty in this area could be eliminated by the use of individual subject data in analyses.

The one clear area of skills deficiency in the reading behavior of poor comprehenders is their inability to organize text. The existence of this difference between good and poor comprehenders provides considerable justification for a comprehension skills view in which oral language comprehension ability plus decoding ability are regarded as not sufficient for the attainment of reading comprehension. Organizational skills specific to the processing demands imposed by the features of print text appear to be required in addition to oral comprehension skills and decoding skills. But the decoding sufficiency view must not be disregarded. It has no trouble accounting for the lack of organizational skills on the part of poor comprehenders. By using a limited capacity model of cognitive processing, proponents of the decoding sufficiency view argue that the requisite organizational strategies are already present in the reader's oral comprehension skills. These strategies are prevented from functioning during the reading task, however, because the poor comprehender expends all available cognitive processing capacity on the task of decoding the text words. Once decoding is performed efficiently enough to not consume all available capacity, the residual will be used to allow full operation of oral comprehension skills including organizational strategies.

Studies reviewed here show that in terms of eye movements, visual scan flexibility, and vocalization patterns, poor readers differ considerably from good readers. Poor comprehenders tend to orally process

text in rigid, word-by-word fashion, with little or no intonation or stress variability to indicate sensitivity to semantic-syntactic organization. Although some poor comprehenders have been found to improve their comprehension performance when text format was changed to facilitate semantic organization, others have not benefited from this manipulation. Unlike good readers, poor comprehenders also were found to not benefit from text organizing information that was supplied in verbal memory tasks, and they did not impose organization when none was present in the input materials.

Reference Notes

1. Calfee, Robert C. Personal communication, August 25, 1980.

2. Bransford, John. Learning to learn by reading and listening. Paper presented at the Reading Comprehension Conference, Center for the Study of Reading, University of Illinois, Urbana, May 1980.

References

Buswell, G. T. An experimental study of the eye-voice span in reading. Supplementary Educational Monographs, 1920, whole no. 17, 1-105.

Calfee, R. C., Arnold, R. D., & Drum, P. A. A review of The psychology of reading by Eleanor J. Gibson and Harry Levin. In Proceedings of The National Academy of Education, 1976, Vol. 3, 1-80 (ERIC Document Reproduction Service No. ED 142 930).

Calfee, R. C., & Drum, P. A. Learning to read: Theory, research, and practice. Curriculum Inquiry, 1978, 8, 183-249.

Clay, M. M., & Imlach, R. H. Juncture, pitch, and stress as reading behavior variables. Journal of Verbal Learning and Verbal Behavior, 1971, 10, 133-139.

Cromer, W. The difference model: A new explanation for some reading difficulties. Journal of Educational Psychology, 1970, 61, 471-483.

Cunningham, J. W. An automatic pilot for decoding. The Reading Teacher, 1979, 32, 420-424.

Durkin, D. What classroom observations reveal about reading comprehension instruction. Reading Research Quarterly, 1978, 14, 481-533.

Fleisher, L. S., Jenkins, J. R., & Pany, D. Effects on poor readers' comprehension of training in rapid decoding. Reading Research Quarterly, 1979, 15, 30-48.

Frederiksen, C. H. Discourse comprehension and early reading. In L. R. Resnick and P. A. Weaver (Eds.), Theory and practice of early reading, Vol. 1. Hillsdale, N.J.: Erlbaum, 1979.

Golinkoff, R. M. A comparison of reading comprehension processes in good and poor comprehenders. Reading Research Quarterly, 1975-76, 11, 623-659.

Golinkoff, R. M., & Rosinski, R. R. Decoding semantic processing, and reading comprehension skill. Child development, 1976, 47, 252-258.

Gough, P. B., & Hillinger, M. L. Learning to read: An unnatural act. Bulletin of the Orton Society, 1980, 30, in press.

Guthrie, J. T. Reading comprehension and syntactic responses in good and poor readers. Journal of Educational Psychology, 1973, 65, 294-299.

Isakson, R. L., & Miller, J. W. Sensitivity to syntactic and semantic cues in good and poor comprehenders. Journal of Educational Psychology, 1976, 68, 787-792.

LaBerge, D., & Samuels, S. J. Toward a theory of automatic information processing in reading. Cognitive Psychology, 1974, 6, 293-323.

Lefton, L. A., Nagle, R. J., Johnson, G., & Fisher, D. F. Eye movement dynamics of good and poor readers: Then and now. Journal of Reading Behavior, 1979, 11, 319-328.

Levin, J. R. Inducing comprehension in poor readers: A test of a recent model. Journal of Educational Psychology, 1973, 65, 19-24.

Mandler, J. A code in the node: The use of a story schema in retrieval. Discourse Processes, 1978, 1, 14-35.

Oakan, R., Wiener, M., & Cromer, W. Identification, organization, and reading comprehension for good and poor readers. Journal of Educational Psychology, 1971, 62, 71-78.

Perfetti, C. A. Language comprehension and fast decoding: Some psycholinguistic prerequisites for skilled reading comprehension. In J. T. Guthrie (Ed.), Cognition, curriculum, and comprehension. Newark, Delaware: IRA, 1977.

Perfetti, C. A., Goldman, S. R., & Hogaboam, T. W. Reading skill and the identification of words in discourse context. Memory & Cognition, 1979, 7, 273-282.

Perfetti, C. A., & Hogaboam, T. W. The relationship between single word decoding and reading comprehension skill. Journal of Educational Psychology, 1975, 67, 461-469.

Perfetti, C. A., & Lesgold, A. M. Discourse comprehension and sources of individual differences. In M. A. Just and P. A. Carpenter (Eds.), Cognitive processes in comprehension. Hillsdale, N.J.: Erlbaum, 1977.

Perfetti, C. A., & Lesgold, A. M. Coding and comprehension in skilled reading and implications for reading instruction. In L. R. Resnick and P. A. Weaver (Eds.), Theory and practice of early reading, Vol. 1. Hillsdale, N.J.: Erlbaum, 1979.

Ryan, E. B. Identifying and remediating failures in reading comprehension: Toward an instructional approach for poor comprehenders. In T. G. Waller and G. E. MacKinnon (Eds.), Reading research: Advances in theory and practice, Vol. 2. New York: Academic Press, in press.

Smith, H. K. The responses of good and poor readers when asked to read for different purposes. Reading Research Quarterly, 1967, 3, 53-83.

Snow, D. Classroom practices in reading comprehension. (Technical Note No. 2-80/12) SWRL Educational Research and Development, Los Alamitos, CA, 1980.

Steiner, R., Wiener, M., & Cromer, W. Comprehension training and identification for poor and good readers. Journal of Educational Psychology, 1971, 62, 506-513.

Weber, R. M. First-graders' use of grammatical context in reading. In H. Levin and J. Williams (Eds.), Basic studies in reading. New York: Basic Books, 1970.

Weinstein, R., & Rabinovitch, M. S. Sentence structure and retention in good and poor readers. Journal of Educational Psychology, 1971, 62, 25-30.

Wiener, M., & Cromer, W. Reading and reading difficulty: A conceptual analysis. Harvard Educational Review, 1967, 37, 620-643.

Willow, D. M. Reading between the lines: Selective attention in good and poor readers. Child Development, 1974, 45, 408-415.